



Theta Pro2Serve Management Company, LLC



Managed by
Theta Pro2Serve Management Company, LLC
for the Portsmouth/Paducah Project Office
of the United States Department of Energy

Environmental Management & Enrichment Facilities

Data Management Implementation Plan for the Decontamination and Decommissioning of the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio



This document is approved for public release per review
by:

Henry Thomas _____ 10/02/2006
PORTS Classification/Information Officer Date

**Data Management Implementation Plan
for the
Decontamination and Decommissioning
of the
Portsmouth Gaseous Diffusion Plant,
Piketon, Ohio**

Date Issued – October 2006

Prepared for the
U.S. Department of Energy
Portsmouth/Paducah Project Office

THETA PRO2SERVE MANAGEMENT COMPANY, LLC
managing the
Infrastructure Activities at the
Portsmouth Gaseous Diffusion Plant
under contract DE-AC24-05OH20193
for the
U.S. DEPARTMENT OF ENERGY

CONTENTS

ACRONYMS	v
1. INTRODUCTION.....	1
1.1 PROJECT MISSION.....	1
2. DM ACTIVITIES	2
2.1 DATA QUALITY OBJECTIVES.....	2
2.2 DATA TYPES.....	4
2.2.1 Field Data	4
2.2.2 Laboratory Data.....	5
2.2.3 Project Documents	5
2.3 COLLECT/PROCESS FIELD SAMPLES	5
2.4 DATA EVALUATION AND STORAGE.....	5
3. PROJECT SPECIFIC DMIP DEVELOPMENT AND DATA LEVELS	6
3.1 DATA LEVELS	6
3.2 DM INTERACTIONS	7
3.3 DATA TYPES.....	7
3.4 FIELD MEASUREMENTS	9
3.5 ANALYTICAL DATA	9
3.6 GIS COVERAGE.....	10
3.7 DATA FORMS/LOGBOOKS	10
3.7.1 Field COC Forms	10
4. DATA AND DATA RECORDS TRANSMITTALS	11
4.1 PORTSMOUTH WASTE INFORMATION SYSTEM DATA TRANSMITTALS	11
4.2 DATA RECORD TRANSMITTALS	12
5. DM SYSTEMS	12
5.1 PWEMS.....	12
5.2 PWIS	12
6. REFERENCES.....	13

ACRONYMS

COC	chain-of-custody
D&D	decontamination and decommissioning
DM	Data Management
DMIP	Data Management Implementation Plan
DOE	U. S. Department of Energy
DQO	data quality objectives
GIS	Geographic Information System
HASL	Health and Safety Laboratory
ISMS	Integrated Safety Management System
PARCC	precision, accuracy, representativeness, completeness, and comparability
PCB	polychlorinated biphenyls
PWEMS	Project Waste Evaluation Measurements System
PWIS	Portsmouth Waste Information System
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RMDC	Records Management Document Center
RTL	ready-to-load
SAP	Sampling and Analysis Plan
SOW	Statement of Work
TSCA	Toxic Substances Control Act
USEC	United States Enrichment Corporation
U.S. EPA	U.S. Environmental Protection Agency

1. INTRODUCTION

Ensuring quality data during decontamination and decommissioning (D&D) is an essential element of maintaining quality assurance and continuous improvement throughout D&D operations. Data management (DM) is defined as the planning, development, implementation, and administration of systems for the collection, acquisition, storage, and retrieval of data. The purpose of this Data Management Implementation Plan (DMIP) is to identify and document DM requirements, expected data types, and data process flow for all activities associated with the U.S. Department of Energy (DOE) D&D project at the Portsmouth Gaseous Diffusion Plant. The D&D project will include the planning and performance of work. This DMIP will be implemented for generating, collecting, analyzing, evaluating, and reporting data for the performance of all D&D project work.

To meet current data requirements for the Portsmouth D&D project, the generation, acquisition, and use of data must be effectively and efficiently planned and documented to support defensible decision making. This necessitates that each phase of the DM process (design, methodology, assessment, collection, handling, verification/validation, interpretation/analysis, reporting, reduction/transfer, and archival) be adequately planned and documented. Data must be traceable to the procedures used to produce the data and the personnel generating or collecting the data. Restrictions on the use of the data must be identified and stated with the data for personnel using the information.

The scope of this DMIP is limited to DOE-Portsmouth D&D project data. D&D data includes electronic and/or hard copy records obtained by the project that describe environmental, waste management, engineering, safety and health, quality and other activities critical to sound decision making during D&D planning and performance. Data generated in support of the D&D project (e.g., analytical results from samples) and obtained from sources outside the project (e.g., historical data) fall within the scope of this DMIP. Certain types of information, such as personnel or financial records, are generally considered outside the scope of this DMIP. However, the contractor project manager will evaluate this information for their relevance to sound decision-making (e.g., training records that support sample collection by qualified personnel and data usability).

This DMIP provides the upper level hierarchy of DM requirements for the D&D project. It does not take precedence over nor supersede DM requirements specified by any contractual agreement between DOE and contractors, but it must be consulted during the establishment of these requirements. Specific contract requirements should be flowed down to the project specific DMIP and should not conflict with this document without authorized approval by the contracting officer.

1.1 PROJECT MISSION

Historically, the principle process at the Portsmouth Gaseous Diffusion Plant was enrichment of uranium most recently performed by the United States Enrichment Corporation (USEC), a non-government business entity. Enrichment of uranium is the separation of the U-235 isotope from the U-238 isotope of uranium via gaseous diffusion to increase the concentration of the U-235 isotope. Due to the nature of the process, the types of wastes generated at the site included low-level radioactive and non-radioactive solid and liquid wastes. These wastes may also be regulated as Resource Conservation and Recovery Act (RCRA) or Toxic Substances Control Act (TSCA) wastes as defined by Code of Federal Regulations (CFR) Title 40 (CFR 2000). Some of these wastes have been released into the environment around the Portsmouth plant.

USEC continued its uranium enrichment shipping and transfer operations at the Portsmouth plant until June 2002 and has placed the production facilities at Portsmouth into a cold standby mode, under contract with DOE. The cold standby mode allows the plant to be maintained in a condition so that uranium enrichment production could restart within 18 to 24 months, if necessary. Since October 2005, the facilities are transitioning to a cold shutdown mode with no expectation of restarting the enrichment operations.

DOE and its contractors are responsible for planning and performing D&D activities at the gaseous diffusion site. These D&D activities will generate an extensive amount of data that must be managed in a manner that will guarantee their validity, quality (PARCC - precision, accuracy, representativeness, completeness, and comparability), and accessibility will meet evidentiary standards. These activities involve the generation, acquisition, and use of various types of data, including the characterization of potential wastes derived from existing diffusion plant equipment and facilities. The responsible contractors collecting this data are required to manage the data generated from the aforementioned activities to support site management decisions about environmental impacts, human health risks, and waste disposition. The data must be technically and legally defensible, as well as, readily retrievable in a timely, cost-effective manner.

2. DM ACTIVITIES

2.1 DATA QUALITY OBJECTIVES

The most efficient way to ensure appropriate and cost effective DM is to establish the criteria for defensible decision making before the work begins, and develop a data collection design based on these criteria. The process is commonly known as the development of Data Quality Objectives (DQOs).

Contractors must establish DQOs for D&D project data. The DQOs are a significant step in implementing the five General Assessment Factors for data established by the U.S. Environmental Protection Agency (U.S. EPA) to judge the credibility of scientific data. The process can be rigorously applied as defined in EPA QA/G-4, *Guidance for the Data Quality Objective Process* (U.S. EPA 1994) for complex data needs, or applied in a simplified, condensed, graded approach suitable for each data type. However DQOs are applied, they must be documented and accomplish the following tasks:

- Clarify the objective,
- Define the most appropriate type of data to collect,
- Determine the most appropriate conditions in which to collect the data, and
- Specify the tolerable data limits or data errors that will be used as the basis for establishing the quantity and quality of the data needed to support the decision.

The contractor Project Manager will ensure completion of the data quality objective process as shown in Fig. 1 of this document. This process identifies the problem and defines the data collection process needed to support decisions regarding the problem and assures that the collected project data has a quantifiable degree of certainty that data are sufficient for their intended use.

DQO Process Flowchart

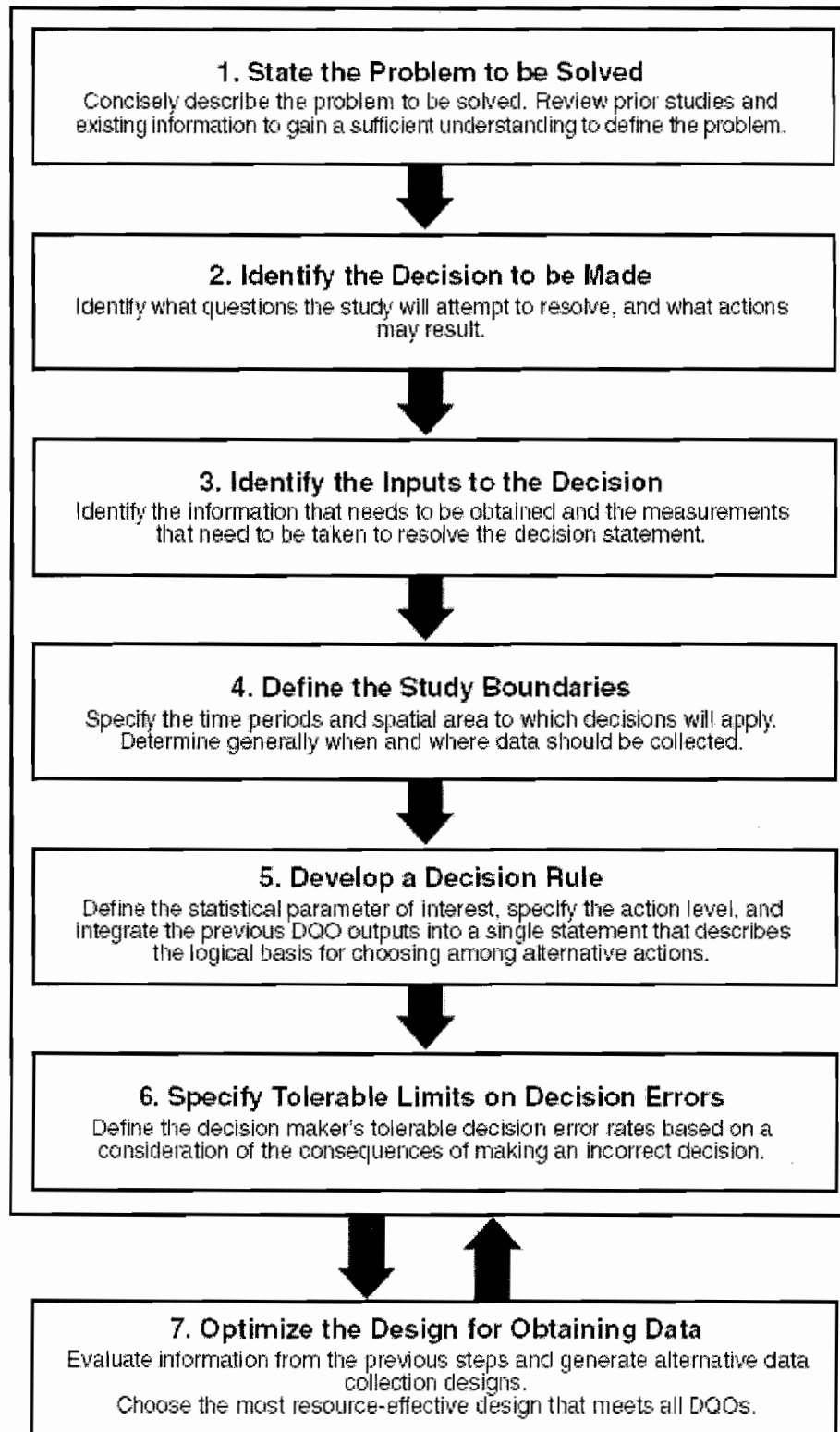


Fig. 1. DQO Process Flowchart.

Planning for the development of DQOs includes:

- Definition of the project/task scope and objectives and the desired action or result from the work;
- Identification of organizations that need to participate in the project/task and their role in planning, implementation, and assessment activities;
- Identification of data required to achieve the desired action or result;
- Identification of the quality assurance and quality control requirements to establish the quality of data collected or produced, including:
 - Data quality indicator (e.g., PARCC) goals,
 - Acceptable level of confidence (or uncertainty), and
 - Level of data validation and verification needed;
- Identification of the documentation needed to adequately describe the quality of data collection and results;
- Identification of necessary personnel, their needed skills, qualifications, training, and required types of equipment and materials;
- Identification of special applicable regulatory requirements and other constraints;
- Identification of the conditions under which work will be suspended and completed;
- Determination of assessment tools needed (e.g., technical reviews, peer reviews, readiness reviews, surveillances, assessments); and
- Identification of methods/procedures for collecting, analyzing, storing, retrieving, and reporting data produced.

2.2 DATA TYPES

Generally, the hardcopy and electronic data that will be generated by the project will fall into three categories:

- Field data
- Laboratory data
- Project documents

2.2.1 Field Data

Field data includes reconnaissance, walkthroughs, surveillances, inspections, health and safety, monitoring, testing, sampling, calculations, photographic, and other data. Consistent documentation and accurate recordkeeping procedures are critical during these activities because subsequent decisions will be made on the basis of the information gathered in the field. Field logbooks are a primary record of field activities. Managers and supervisors will ensure that personnel keep chronological records of the work

they perform or oversee, and that all data collection forms, labels, seals, Chain-of-Custodies (COCs), and other identifying information for samples, photographs, and other media are properly filled out.

2.2.2 Laboratory Data

Laboratory data includes data generated from the chemical, geotechnical and other analysis of samples sent to permanent and field laboratories. This data consists of laboratory certifications (International Organization for Standardization, A2LA, etc.), equipment calibration records, performance sample results, assessment reports, data packages that report the results of analysis, and associated data verification and validation reports.

2.2.3 Project Documents

Project documents include all administrative documents, correspondence, and reports researched or generated during the D&D project. This includes, but is not limited to, historical data, plans (work, sampling and analysis, project specific DM, quality, health and safety, etc.), reports, white papers, letters, memorandums, data reduction/consolidation notes, tables and spreadsheets, maps, drawings, and photographs. The administrative record may be the vehicle for indexing and storing many of these documents.

2.3 COLLECT/PROCESS FIELD SAMPLES

Contractor personnel will sample, preserve, and package samples in accordance with requirements defined by the U.S. EPA in chapters three (3), four (4), and nine (9) of SW-846 (Latest Edition), "*Test Methods for Evaluating Solid Waste - Physical/Chemical Methods*." Consult the DOE HASL-300, *The Procedures Manual of the Environmental Measurements Laboratory* (DOE 1997) for radiological sample preservation requirements. The project shall ship samples to a contract laboratory (ies) in accordance with requirements defined in CFR Title 49, Transportation (CFR 2005).

2.4 DATA EVALUATION AND STORAGE

Data quality must be assessed during all phases of generation and usage in accordance with the established DQOs and requirements of DOE O 414.1C, Quality Assurance (DOE 2005), (especially sections on Quality Improvement and Independent Assessment) to ensure its applicability, quality, integrity, and usability.

The project shall review, verify, and validate analytical data in accordance with approved procedures to be developed by the contractor. Data verification is a systematic process that results in the evaluation of the completeness, correctness, consistency, and compliance of a data set against a standard or contract. Analytical data validation, including field and laboratory data review, is a systematic process performed externally from the data generator, which applies a defined set of performance-based criteria to a body of data which may result in qualification of the data. Data assessment is an integration of all information collected about a result to evaluate data usability.

Data that is generated should be maintained in a manner that will guarantee its integrity, but will make it easily accessible to personnel requiring the information. Data may be made available via electronic databases, field record areas (i.e., satellite accumulation areas), and document management centers. Processes have been established that ensure the identification, indexing, entry, environmental preservation and protection, control, backup, reporting, access, searching, retrieval, and security of data

for the DOE authorized retention and disposition lifecycle. Contractors will develop procedures to implement these processes and perform management assessments of these processes to assess compliance with these requirements. Electronic data must meet the applicable software quality assurance requirements DOE O 414.1C, Quality Assurance.

3. PROJECT SPECIFIC DMIP DEVELOPMENT AND DATA LEVELS

3.1 DATA LEVELS

The following DM guidelines provide disposition requirements for D&D project data. The guidelines establish the basis for the development of a project specific contractor DMIP to support DM requirements for the D&D project at the Portsmouth Gaseous Diffusion Plant. The guidelines refer to the Project Waste Evaluation Measurements System (PWEMS) and the Portsmouth Waste Information System (PWIS). These electronic databases will be developed by the contractor specifically to maintain D&D characterization data. These databases are expected to be analogous to the environmental restoration data system currently used at Portsmouth. A four-level approach is provided to define the level of data importance/scrutiny/archival; level 4 pertains to project data with the highest level of regulatory scrutiny.

- Type 4 – Data used to support RCRA actions (e.g., groundwater monitoring, RCRA corrective action, etc.) and National Pollutant Discharge Elimination System monitoring; analytical data, field measurements, and other data, as applicable, to be initially electronically transmitted to PWEMS with a hardcopy archived in the contractor-operated Portsmouth Gaseous Diffusion Plant Records Management Document Center (RMDC) for storage and retention. After data verification and validation, the PWEMS data will be transmitted to and archived in the PWIS. With management approval, analytical data, field data, and summaries retained in PWIS may be reported to regulatory agencies.
- Type 3 – Data used to verify previous RCRA corrective actions/measures, groundwater treatment facility influent and effluent monitoring. Analytical electronic and hardcopy data will be archived in PWIS and RMDC, respectively.
- Type 2 – Industrial hygiene monitoring results, analytical data to support disposal of non-radioactive waste at a local landfill. Analytical electronic and hardcopy will be archived in PWIS and RMDC, respectively.
- Type 1 – Confirmation sampling NOT used to verify previous Type 2, Type 3, or Type 4 project data; electronic archival not required but hardcopy will be archived in RMDC.

As appropriate, the contractor will plan and perform the DM activities that are appropriate to support the above types of project data. Those activities could include, but are not limited to:

- define scope of work [per DQOs process to include Integrated Safety Management System (ISMS)]
- acquire existing data
- plan data collection [Sampling and Analysis Plan (SAP), Quality Assurance Project Plan (QAPP), etc.]
- prepare for field activities

- collect field data
- process field data
- collect field samples
- submit samples for analysis
- process laboratory analytical data
- review data
- verify data
- validate data
- reduce/consolidate data and records
- interpret/analyze data
- submit data to PWIS

3.2 DM INTERACTIONS

Figure 2 presents a flowchart detailing possible DM processes and functional responsibilities associated with Type 4 project data as defined in Sect. 3.1 of this plan.

3.3 DATA TYPES

The types of data expected to be collected in support of Portsmouth Gaseous Diffusion Plant D&D projects include, but are not limited to:

- drawings (e.g., AutoCAD drawings/Geographic Information System (GIS) layers, which define environmental media sampling locations),
- photographs (aerial, waste drum contents, underground storage tanks, etc),
- facility observations,
- inspection checklists,
- field measurements/observations (e.g., groundwater level measurements, liquid waste pH measurements, etc.),
- inspection results (wells, waste drums, DUF₆ cylinders, etc),
- sampling and analysis data, and
- logbooks.

Phases of DM Process & Associated Activities

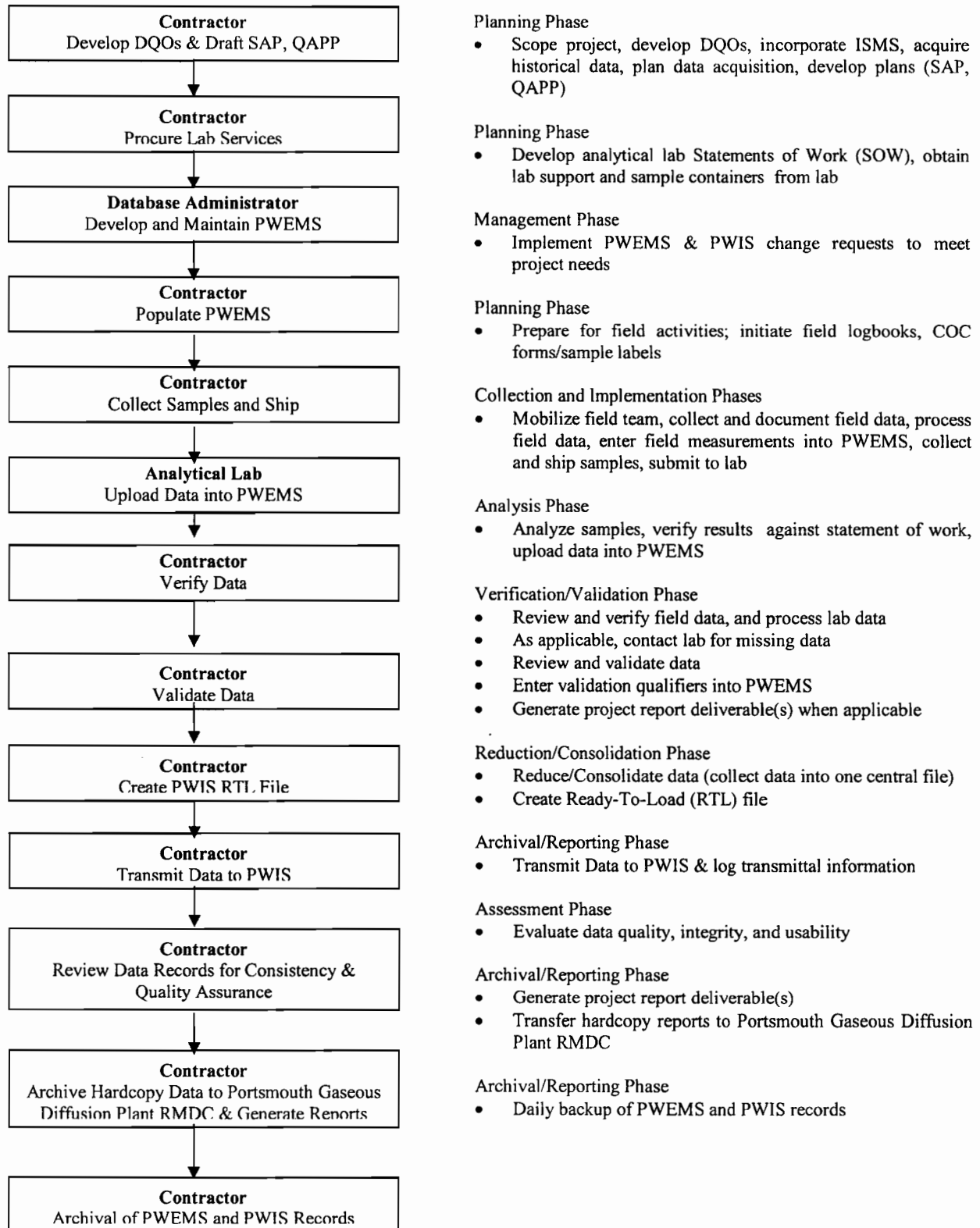


Fig. 2. Phases of DM process and associated activities.

As applicable and as required by contract, the project shall enter/log the above data types into PWEMS and PWIS.

3.4 FIELD MEASUREMENTS

Personnel shall perform a variety of field measurements in support of the DOE-Portsmouth D&D project. These include, but are not limited to, groundwater level measurements, surface water depths, water flow rates, temperature, pH, conductivity, purge rates, dissolved oxygen, effluent flow rates, industrial hygiene monitoring, radiological screenings, non-destructive assay measurements, liquid waste pH measurements, and waste stream volumes.

3.5 ANALYTICAL DATA

In the project-specific DMIP, the contractor shall minimally describe the sample media, analyses of interest, types of analyses that will be performed, and the estimated number of samples that the project will collect. The DMIP should be developed prior to sampling.

Samples taken by a contractor for the purpose of characterizing facilities or D&D waste will generally be sent to laboratories qualified to perform the required analyses. Analytical data generated by laboratories in support of the DOE-Portsmouth D&D project include, but are not limited to, the following.

- soil, water, liquid waste, and solid waste samples to be analyzed for:
 - SW846 constituents such as metals, pesticides, polychlorinated biphenyls (PCBs), volatile organic compounds, semivolatile organic compounds, total organic halides, total organic carbon, total petroleum hydrocarbons, oil and grease, reactive sulfide, reactive cyanide, dioxins, and furans;
 - radiological constituents such as technetium-99, total uranium, uranium isotopic, isotopic americium, isotopic curium, Np-237, isotopic plutonium, isotopic thorium, and gamma emitters;
 - physical determinations, such as soil compaction (optimum moisture content), particle size, heat content, ash content, ignitability;
 - asbestos;
 - other EPA tests to include total dissolved solids, total suspended solids, turbidity, ammonia, nitrite/nitrate, chloride, sulfate, alkalinity, phosphorus, and chemical oxygen demand;
- air samples to be analyzed for National Institute for Occupational Safety and Health constituents, such as asbestos, dust, metals, and Trichloroethene;
- Portsmouth Gaseous Diffusion Plant ambient air samples are analyzed for radiological constituents and fluorides under Radiological National Emission Standards for Hazardous Pollutants guidelines;
- wipe samples to be analyzed for PCBs and radiological constituents.

3.6 GIS COVERAGE

Each contractor taking samples to support a regulatory reporting requirement shall enter easterly and northerly coordinates (in the Portsmouth Gaseous Diffusion Plant coordinate system) into PWEMS for each fixed sampling location. Personnel shall ensure the coordinates are pre-populated in PWEMS during the planning phase of the project. These steps will ensure that the data can be accessed by the GIS and displayed according to location on the site. Each contractor shall incorporate these requirements into specific procedures used to performed facility or waste characterization.

3.7 DATA FORMS/LOGBOOKS

During the Portsmouth Gaseous Diffusion Plant D&D project, contractors will utilize reports, forms, and logbooks to capture data. All forms used to capture data should be referenced in specific contractor procedures. Those project activities generally requiring form use include, but are not limited to the following:

- waste inspection (e.g., waste operation logs to support RCRA Part B Permit)
- sample collection and custody
- field measurements
- calibration of field and lab instruments
- decontamination of sampling equipment
- facility inspections
- surveillance and maintenance inspections
- shipping manifests
- lab data verification/validation
- activity hazard analyses
- radiological work permits
- inspection and acceptance testing

3.7.1 Field COC Forms

Field COC forms are routinely used at the Portsmouth Gaseous Diffusion Plant. The form generally includes the following information shown in Table 1. Additional information may be included as appropriate for the specific sampling and analysis project. These forms are referenced in specific contractor procedures associated with both sampling and laboratory analyses. The COC forms contain sample-specific information recorded during sample collection and analyses. Any deviations from the sampling plan are noted on the field COC form. The Sample Team Leader reviews each field COC form for accuracy and completeness, as soon as practical, following sample collection. Similarly, as the sample is transferred to laboratory personnel, the COC form is used to document that the sample is properly maintained and uncompromised during the analytical process.

Table 1. Field COC form information

Preprinted information	Information entered manually or through automated data acquisition equipment
COC number	logbook
project name or number	sample team leader

Table 1. Field COC form information (continued)

Preprinted information:	Information entered manually or through automated data acquisition equipment:
planned sampling date	clean lot number
task	sample date and time
sample ID number	top and bottom depths and units (optional)
sampling location (e.g., W05C00-08)	equipment (optional)
sample type (e.g., FB = field blank, FR = field replicate)	preserved pH (optional)
sample matrix (e.g., soil)	sample comments (optional: these are manually entered and are not collected via bar code readers)
analysis (e.g., lead)	
sampling device	
sample container (volume, type, quantity)	
preservative	
sampling procedure	
associated sample ID number (for field Quality Control samples)	
sample status	

4. DATA AND DATA RECORD TRANSMITTALS

4.1 PORTSMOUTH WASTE INFORMATION SYSTEM DATA TRANSMITTALS

All data generated for Types 4, 3, and 2 sampling activities shall be transmitted electronically to PWIS. Contractors will develop specific procedures to transfer data from laboratories into the DOE data system. PWEMS-PWIS is the DM/archival system for DOE-Portsmouth D&D data. The Analytical Master Specification Electronic Deliverable electronic data deliverable may be uploaded by laboratories directly into the PWEMS database creating an electronic sample/lab information record in a PWIS RTL format. Contractor personnel will then verify the PWEMS data. Following resolution of any errors, data will be reviewed for classification. No restricted data will be entered into PWIS. Once the classification review is complete, data will be transferred into the PWIS database for final archiving and use.

In addition, all electronic data files will be supplied to the project on disk for archiving.

Project personnel will contact PWIS database administration staff to communicate/coordinate projected transmittal dates and to ensure that all RTL mandatory fields are completed.

4.2 DATA RECORD TRANSMITTALS

All data records will be transmitted to the contractor RMDC per procedures developed by the contractor. D&D data records that are transmitted to the RMDC will include the PWIS TRANS_ID (PWIS transmittal ID number) associated with the data.

5. DM SYSTEMS

5.1 PWEMS

PWEMS is the DM system that supports Portsmouth sampling and measurements collection activities and generation of PWIS RTL files. PWEMS can be accessed by appropriate Portsmouth staff throughout the life cycle of the project.

All Types 2, 3, and 4 projects shall use PWEMS for the functions listed below.

- initiate the project;
- plan for sampling;
- collect samples and field measurements;
- ship samples to the laboratory;
- receive and process analytical results;
- evaluate and qualify data;
- analyze and access data;
- transfer project data (in RTL format) to PWIS;
- report generation

PWEMS may be used on Type 1 projects to complete the above functions as well.

5.2 PWIS

PWIS is the centralized, standardized, quality assured, and configuration controlled DM system that is the long-term repository for environmental and waste data (measurements and geographic) for all D&D projects. PWIS is comprised of hardware, commercial software, customized integration software, a measurements database, a geographic database, and associated documentation.

All Types 2, 3, and 4 projects will use PWIS for the functions listed below.

- access to existing data
- analysis and access to project data
- analysis and access to data across projects
- spatial analysis
- report generation
- long-term storage of project data
- submit data to regulators

PWIS may be used on Type 1 projects to complete the above functions as well.

6. REFERENCES

CFR (Code of Federal Regulations) 2000. CFR Title 40, *Protection of Environment*, July 2000.

CFR (Code of Federal Regulations) 2005. CFR Title 49, *Transportation*, October 2005.

DOE (U.S. Department of Energy) 1997. The Procedures Manual of the Environmental Measurements Laboratory, Volume I, 28th Edition, HASL-300, February 1997.

DOE 2005. *Quality Assurance*, DOE Order 414.1C, June 2005.

U.S. Environmental Protection Agency. *Test Methods for Evaluating Solid Waste - Physical/Chemical Methods*, SW-846.

U.S. EPA 1994. *Guidance for the Data Quality Objective Process*, EPA/QA-G4, September 1994.